

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

After entry of the foregoing amendment, Claims 30-32, 34-47, and 49-80 are pending in the present application. Claims 30-32, 34-47, and 49-51 are amended, Claims 1-29, 33, 48, and 52-58 are canceled without prejudice or disclaimer, and Claims 59-80 are added by the present amendment. No new matter has been added.

In the outstanding Office Action, Claims 30-31, 34, 36-38, 52, 55 and 57 were rejected under 35 U.S.C. § 102(b) as anticipated by Chuss (US 4,071,944); Claims 30-32, 37, 39 and 52-54 were rejected under 35 U.S.C. § 102(b) as anticipated by Comet (US 3,190,785); Claims 30-32 and 37 were rejected under 35 U.S.C. § 102(b) as anticipated by Buchaklian (US 3,547,744); Claims 30-31, 33, 37, 52-53, 55 and 57 were rejected under 35 U.S.C. § 102(b) as anticipated by Beltz (US 4,466,852); Claims 30-32, 36 and 52-54 were rejected under 35 U.S.C. § 102(b) as anticipated by Fujimoto (US 5,897,743); Claim 55 was rejected under 35 U.S.C. § 103(a) as unpatentable over Chuss; Claims 30, 31, 33, 36, 42-47, 52 and 58 were rejected under 35 U.S.C. § 103(a) as unpatentable over Henley (US 5,985,742) in view of Iwane (US 6,140,209); Claims 48-51 are rejected under 35 U.S.C. § 103(a) as unpatentable over Henley in view of Iwane, and further in view of Yanagita (US 6,418,999); Claim 56 was rejected under 35 U.S.C. § 103(a) as unpatentable over Chuss in view of Bull; Claims 40 and 41 were indicated as allowable if rewritten in independent form.

Applicants thank Examiner Osele for the indication of allowable subject matter. Applicant and Applicants' representative further thank Examiner Osele for the interview granted on September 4, 2003. During that interview, the outstanding rejections were discussed, as well as claim amendments addressing the rejections. Examiner Osele tentatively indicated that the claim amendments proposed during the interview could

distinguish the claims over the applied art, and further indicated he would consider those claim amendments when formally presented.

Applicants note that the present claims are generally amended as follows. Independent Claims 30 and 47, and new dependent Claims 59-64 are amended to recite features that were not proposed during the interview. New independent Claim 65 is added to set forth the subject matter of Claim 30, and to recite the features that were proposed for that claim during the interview. Further explanation of these amendments is provided herein.

Addressing now the rejections of Claims 30-32 and 34-46, summarized above, those rejections are respectfully traversed.

As amended, independent Claim 30 is directed to:

A process for separating two semiconductor substrate wafers along an interface including all points of contact between the two wafers, both wafers bonded to one another at adherent faces of the interface, the process comprising:

forming at least one cavity in at least one of the wafers that permits access of separation means to at least one predetermined zone of the interface; initiating separation of the wafers along the interface by applying the separation means to the predetermined zone; and

continuing separation of the wafers along the interface, by applying the separation means to the predetermined zone and separated portions of the interface, until a desired degree of separation is achieved,

wherein points of entry of the cavity are not located solely at an edge surface of the wafers.

Thus, Claim 30 is amended to clarify the features originally presented, and to further recite the following two features: (1) the process is directed to separating semiconductor substrate wafers;<sup>1</sup> and (2) the points of entry of the cavity are not located solely at an edge surface of the wafers.<sup>2</sup> Claim 47 also recites features (1) and (2).

With respect to the first (1) feature, Applicants submit that neither Buchaklian, Comet, Beltz, nor Chuss disclose a process or device for separating two semiconductor substrates that are bonded to one another. More particularly, Buchaklian and Comet do not

---

<sup>1</sup> Support for this feature is provided in Applicants' specification, at least, at page 13, lines 4-11.

<sup>2</sup> Support for this feature is provided in at least Figure 2 of the present application.

address the separation of a semiconductor substrate, and Beltz and Chuss do not address the separation of two semiconductor substrates. Applicants further note that Chuss and Beltz teach the use of standard handling tools, which are generally not compatible with conventional supports for microelectronics.

Applicants further submit that an assembly of two bonded semiconductor substrates has implicit technical features that are not suggested by the four noted references. More particularly, such an assembly implicitly allows for one of the substrates to be subjected to standard semiconductor fabrication processes (*e.g.*, annealing, depositions, chemical treatments, and implantations). None of the four references teach a device that would allow for standard fabrication processes to be performed on one of the two bonded wafers.

With respect to the second (2) feature, Applicants submit that neither Henley, Iwane, Fujimoto, nor Yanagita teach a process or device involving a cavity with points of entry that are not located solely at an edge surface of bonded substrates. Rather, the four references teach processes and devices in which separation is *only* initiated via a cavity located at an edge of bonded substrates.

Accordingly, for the reasons stated above, Applicants respectfully request that the rejection of independent Claims 30 and 47, and the claims depending therefrom, be withdrawn.

New independent Claim 65 recites the following features, which were discussed during the interview: a separation means comprising a liquid or gas; a lower-pressure chamber bounded in part by at least one wafer; a stopper within the lower-pressure chamber for preventing excessive deformation of the wafers; and the cavity formed in the interface portion of the second wafer must extend onto the interface of both wafers, and must face the interface portion of the first wafer. Thus, for example, when the first wafer includes a

beveled edge, the cavity formed in the second wafer extends to a non-engraved portion of the first wafer.

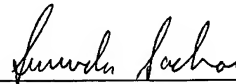
In accord with the discussions held during the interview, Applicants submit that the features proposed during the interview distinguish independent Claim 65 in the following manner: Comet, Buchaklian, and Fujimoto do not disclose a separation means comprised of a liquid or gas; Chuss does not disclose either a stopper for preventing excessive deformation of the wafers or high- and low-pressure chambers; and Henley in view of Iwane does not disclose a cavity of the second wafer extending beyond the beveled edge of a wafer.

Accordingly, Applicants respectfully submit that independent Claim 65, and the claims depending therefrom, are also allowable.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.



\_\_\_\_\_  
Gregory J. Maier  
Attorney of Record  
Registration No. 25,599

22850

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
GJM/SNS/STD/cja

Surinder Sachar  
Registration No. 34,423